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MAGNETIC TAPE CARTRIDGE

William P. Lear, Wichita, Kans., assignor to Lear Jet Industries, Inc., a corporation of Delaware

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This invention relates to magnetic tape cartridges, and more particularly to novel cartridge construction and configuration for endless tape that is self-contained, sturdy and simple to use.

The cartridge of the present invention is effectively and directly handled for insertion-to-play, standby-hold or removal from the player unit. It is provided with a unique notch arrangement that coacts with a retention roller in the player. By using two successive notches, manual positioning of the cartridge determines its operational mode. This permits the use of a slotted opening in the player for the cartridge, and effects its playing directly, without the need for collateral levers or controls. Such player system is shown and described in the copending patent application, Combination Radio and Magnetic Cartridge Player, Ser. No. 392,212 filed Aug. 26, 1964, and assigned to the same assignee.

Finger grips are incorporated at the rear section of the cartridge hereof for its operational handling. A recessed region is provided at the back end of the cartridge to protect a contained card or label denoting the title or contents of the tape recordings therein. Further a ramp is made integral with the cartridge forward end to permit the retention roller of the player to ride up the cartridge side to the hold-notches. A novel wafer plate is placed over the magnetic tape reel to stabilize its endless pathways. The pinch roller is mounted within the cartridge on a composite wire spring that biases the roller for play, and latches the reel during the non-play mode.

These and further features, advantages and objects of this invention will become more apparent from the following description of an exemplary embodiment thereof, illustrated in the drawings, in which:

FIG. 1 is a perspective illustration of the exemplary cartridge of the present invention.

FIG. 2 is a plan view of the cartridge, partly broken-away, and in coaction with the player retention roller.

FIG. 3 is an elevational view of the cartridge, as seen from the left side of FIG. 1, opposite the notched side.

FIG. 4 is an elevational view of the notched side of the cartridge.

FIG. 5 is an enlarged partial view of a rear corner of the lower cartridge section.

FIG. 6 is a cross-sectional view through the rear section of the cartridge, taken along the line 6—6 of FIG. 1.

FIG. 7 is an elevational view of the forward end of the cartridge.

FIG. 8 is a plan view of the cartridge interior, with the cover removed.

FIG. 9 is an elevational view of the composite spring used in the invention cartridge.

The magnetic tape cartridge **15** is basically constructed of rugged molded components and relatively inexpensive for mass marketing. Cartridge **15** is designed as an essentially self-contained unit, with a reel of tape **20** in endless array therein. In use, the cartridge is manually positioned in the player, to effect direct play without auxiliary manipulation. The player system and unit therefor is shown in the aforementioned patent application. The forward end **16** of the cartridge **15** is inserted into the slotted region of the player chassis.

The pinch roller **17** is rotatably mounted on a wire spring **18**, and biased outwardly for engagement with drive capstan **19**, with the tape loop portion **21** therebetween. The forward end **16** abuts a fixed stop **22** to

set the cartridge **15** in the play position. Besides engagement with the capstan, the tape loop **21** is pressed against the face of the magnetic pick-up head **23**. The tape **21** is moved past head **23** at a predetermined uniform velocity, for reproduction of the recordings on the tracks on the tape. A semi-circular forward cut-out **24** permits the capstan **19** to somewhat enter the cartridge end **16** and coact with the container roller **17**. A spring-pressed pad **25** stably holds tape **21** against the head **23**.

The cartridge region within the player contains a side guide **26** opposite the one, indicated by dotted line **27**, that contains a retention roller **28**. The forward cartridge end **16** has its corner, on the notched side **31**, inclined in the form of a ramp **30**. The roller **28** is biased inwardly towards the cartridge **15** by leaf spring **29**. The ramp **30** engages the roller initially, as indicated schematically at **28'**, and thereupon moves it outwardly to the cartridge side **31**. The ramp **30** permits the cartridge **15** to be moved forward, beyond the roller (**28**) position. When fully "seated" against the stop **22**, the notch **32** in the side **31** of the cartridge is firmly engaged with the roller **28** (see FIG. 2).

The roller **28** latches the cartridge **15** in its play mode, pressing its side **33** against the side-guide **26** into stable physical relation. The notch **32** has a forward inclined portion against which the roller **28** presses in this play mode. The resultant force components include one that maintains the forward cartridge end **16** in this tape play position, firmly against stop **22**, head **23**, and capstan **19**. A second notch **34** is a shallow indentation in side **31**, forward of notch **32**. Notch **34** engages retention roller **28** before notch **32** is reached upon cartridge insertion. Such intermediate position of the cartridge **15**, held at its notch **34**, is its "hold" mode in the player, as described in the aforesaid copending case.

Spring **29** exerts sufficient force on retention roller **28** to maintain the cartridge **15** firmly in play position, even over bumps when in mobile use. The ramp **30** facilitates cartridge insertion, as set forth. The cartridge is pulled-out of the player upon disengagement with the roller **28**. The cartridge hereof is provided with built-in finger grip areas to aid and insure ready handling in its manual insertion and removal from the player. The grip areas are at the back region of the cartridge.

A top finger grip cavity **35** extends laterally across the upper rear region. Finger cavities **36**, **37** are formed in cartridge sides **31** and **33** respectively, near the outer or rear section thereof. As this cartridge section remains exposed, even when inserted in its play mode, one can readily maneuver it into its respective removal, play or hold modes. The exemplary cartridge is 4.0" wide, 5.5" long and ⅞" thick. Its contained tape reel, with eight recorded tracks, driven at 3.75" per second provides two hours of two-track stereophonic music playing. The cartridge **15** is readily handled with one hand, for direct control, even while driving an automobile. Its use and control is as simple as operating the radio in the automobile.

The cartridge **15** incorporates two parallel longitudinal ridges **40**, **41** on its cover, near its sides. The base is grooved at **42**, **43** with parallel portions that are arranged to overlap corresponding ridges **40**, **41** of another cartridge upon which it is stacked. This prevents their side slippage when stacked. The cover has a slight depression in the region **44** between ridges **40**, **41** into which a card or label is pasted that contains a list of the recordings therein. A title label **45** is attached to a recessed panel **46** across the back **47** of the cartridge **15**. The panel **46** is integral with the base of the cartridge. The external face of the panel **46** is inclined to better show up the label **45**. The visible yet interior position of the label affords it protection from handling.

The cover and base of the cartridge are molded of